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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/808,988	03/16/2001	Koichi Masukura	204905US2SRD	5115

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
HARRISON, CHANTE E	

ART UNIT	PAPER NUMBER
2628	

NOTIFICATION DATE	DELIVERY MODE
09/06/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)
	09/808,988	MASUKURA ET AL.
	Examiner	Art Unit
	Chante Harrison	2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 08 June 2007.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-26 is/are pending in the application.

4a) Of the above claim(s) 15,21 and 27 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-14,16-20 and 22-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to communications: Amendment, filed on 6/8/07. This action is made FINAL.

2. Claims 1-14, 16-20, 22-26 are pending in the case. Claims 1, 12, 16, 20, 22 and 26 are independent claims. Claims 1, 12, 22 and 26 have been amended. Claims 15, 21 and 27 are canceled.

Claim Rejections - 35 USC § 101

1. The 35 U.S.C. 101 is withdrawn.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-14, 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin-Hun Kim, U.S. Patent 5,883,977, 3/1999.

As per independent claim 1, Kim discloses generating a polygon approximating a contour of the object region in each of the frames, the polygon having vertexes (col. 3, ll. 23-30); associating each of the vertexes in each of the frames with each of the same vertexes in an adjacent frame (i.e. mapping the vertices between predicted vertices and motion compensated vertices) (col. 3-4, ll. 60-15); obtaining trajectories of positions of the same vertexes in X and Y coordinates, in each of the trajectories linking the same vertexes through the frames for each video frame sequence of digital data (i.e. use of a global motion vector, GMV, to determine the amount of shift of pixel positions of the current and the predicted contours) (col. 3, ll. 30-60); generating the object region data, the object region data comprising an approximate function data expressing the trajectories (i.e. using a line to approximate the trajectories) (col. 5-6, ll. 64-5; col. 6, ll. 48-60); and displaying an object based on the object region data (i.e. transmission of the stored reconstructed contour image) (Fig. 1 "transmitter"; col. 5, ll. 30-35; col. 6, ll. 50-60).

Kim fails to expressly disclose <u>at least three</u> frames and linking the same vertexes through the frames based on the <u>time-series variation</u> of the frames.

It would have been obvious to one of ordinary skill in the art to include <u>at least three</u> frames in the method of Kim because Kim teaches an improved method of processing contour information which is used in MPEG coding of transmitted video image data that is processed on a plane/frame (VOP, video object plane) by plane/frame basis, where the plurality of planes/frames includes at least three (col. 1, ll. 30-60). Additionally, it would have been obvious to one of ordinary skill in the art to include linking the same vertexes through the frames based on the <u>time-series variation</u> of the frames in the method of Kim because Kim teaches performing motion compensation to generate intra/inter-coded data (abstract), which is a conventional compression technique that uses similarities between successive image frames, referred to as temporal or inter-frame correlation, to provide moving image representations. One of skill in the art would have been motivated to include at least three frames having linked vertices based on time variation of the frames in the method of Kim because frames are a timed sequence of digital data that together represent video; and linking the vertexes of at least three frames based on time enables the determination of the change in motion between all successive frames of the video. Examiner takes Official Notice as it is well known in the art that pixel positions correspond to X and Y coordinates.

As per dependent claims 2 and 17, Kim discloses the vertexes in each of the at least three frames are associated each of the same vertexes in the adjacent frame such that a distance between each of the vertexes in each of the at least three frames and each of the same vertexes in the adjacent frame is minimum (col. 3, ll. 60-66).

As per dependent claim 3, Kim discloses the distance between each of the vertexes in each of the at least three frames and each of the same vertexes in the adjacent frame is calculated after a center of gravity of the polygon in each of the at least three frames coincides with a center of gravity of the polygon in the adjacent frame (col. 3, ll. 32-38).

As per dependent claims 4, 7 and 10, Kim discloses the trajectories are respectively approximated by predetermined functions, and the object region data is generated by using the functions (col. 3, ll. 30-38).

As per dependent claims 5, 8 and 11, Kim discloses the object region data includes position data of the vertexes (col. 3, ll. 41-45) of each of the at least three frames and association data indicting correspondence of the vertexes between the frames (col. 4, ll. 6-15).

As per dependent claims 6 and 18, Kim discloses the associating each of the vertexes with each of the same vertexes comprises estimating vertexes in the adjacent frame based on the trajectories (i.e. determining a predicted vertex) (col. 3, ll. 60-63), and

selecting the vertexes in the adjacent frame, that are closest to the estimated vertexes (col. 3, ll. 64-66).

As per dependent claims 9 and 19, discloses the associating each of the vertexes with each of vertexes comprises obtaining a characteristic quantity (i.e. distance) of the vertexes of each of the frames (col. 3, ll. 60-67) and associating the vertex in each of the at least three frames and the same vertex in the adjacent frame which have the closest characteristic quantity (col. 4, ll. 10-15).

As per independent claim 12, Kim discloses generating a polygon approximating a contour of the object region in the at least three frames, the polygon having vertexes (col. 3, ll. 23-30); associating each of the vertexes in each of the at least three frames with each of the same vertexes in an adjacent frame (col. 3-4, ll. 60-15); obtaining trajectories, each of the trajectories linking the same vertexes through the at least three frames (col. 3, ll. 30-60); estimating positions of vertexes of a polygon in a next frame based on trajectories, the next frame following a last frame of the at least three frames for which the trajectories are obtained (col. 5, ll. 46-54); moving the position-estimated vertex in accordance with a contour of the object region in the next frame (col. 3, ll. 44-49); updating the trajectories by associating each of the moved vertexes with trajectories linking the vertexes which are the same as the moved vertexes (col. 5, ll. 35-55); and generating the object region data, the object region data comprising an

approximate function data expressing the updated trajectories (col. 5-6, ll. 64-5col. 6, ll. 48-60). The rationale as applied in the rejection of independent claim 1 applies herein.

As per dependent claim 13, Kim discloses the trajectories are respectively approximated by predetermined functions, and the object region data is generated by using the functions (col. 3, ll. 30-38).

As per dependent claim 14, Kim discloses the object region data includes position data of the vertexes (col. 3, ll. 41-45) of each of the at least three frames and association data indicting correspondence of the vertexes between the at least three frames (col. 4, ll. 6-15).

As per independent claim 16, Kim discloses an approximation unit (Fig. 1 "201"), an association unit (Fig. 1 "220"); a trajectory obtaining unit (Fig. 1 "280") and an object region data generation unit (Fig. 1 "260") for implementing the method of claim 1. Therefore the rationale applied in the rejection of claim 1 applies herein.

As per independent claim 20, Kim discloses an approximation unit (Fig. 1 "201"), an association unit (Fig. 1 "220"); a trajectory obtaining unit (Fig. 1 "280"); an estimation unit (Fig. 1 "250"); a moving unit (Fig. 1 "280"); an updating unit (Fig. 1 "250"); and an object region data generation unit (Fig. 1 "260") for implementing the method of claim 12. Therefore the rationale applied in the rejection of claim 12 applies herein.

3. Claims 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin-Hun Kim, U.S. Patent 5,883,997, 3/1999, and further in view of Aggelos Katsaggelos et al., "MPEG-4 and Rate-Distortion-Based-Shape Coding Techniques", Proceedings of the IEEE, Vol. 86, No. 6, June 1998.

As per independent claim 22, Kim discloses generate a polygon approximating a contour of the object region in each of the frames, the polygon having vertexes (col. 3, ll. 23-30); associate each of the vertexes in each of the frames with the same vertexes in an adjacent frame of each of the frames (i.e. mapping the vertices) (col. 4, ll. 6-15); obtain trajectories, each of the trajectories linking the same vertexes through the frames for each video frame sequence of digital data (col. 4, ll. 6-15); and generate the object region data, the object region data comprising an approximate function data expressing the updated trajectories (col. 5-6, ll. 64-5col. 6, ll. 48-60).

Kim fails to expressly disclose <u>at least three</u> frames and linking the same vertexes through the frames based on the <u>time-series variation</u> of the frames. Kim also fails to disclose computer readable program code means.

Katsaggelos discloses an application for an coding algorithm like object based analysis synthesis coding which uses object shape, texture and motion to describe moving video objects (pp. 1, col. 2, Para 1).

It would have been obvious to one of ordinary skill in the art to include <u>at least three</u> frames in the method of Kim because Kim teaches an improved method of processing contour information which is used in MPEG coding of transmitted video image data that is processed on a plane/frame (VOP, video object plane) by plane/frame basis, where the plurality of planes/frames includes at least three (col. 1, ll. 30-60). Additionally, it would have been obvious to one of ordinary skill in the art to include linking the same vertexes through the frames based on the <u>time-series variation</u> of the frames in the method of Kim because Kim teaches performing motion compensation to generate intra/inter-coded data (abstract), which is a conventional compression technique that uses similarities between successive image frames, referred to as temporal or inter-frame correlation, to provide moving image representations. One of skill in the art would have been motivated to include at least three frames having linked vertices based on time variation of the frames in the method of Kim because frames are a timed sequence of digital data that together represent video; and linking the vertexes of at least three frames based on time enables the determination of the change in motion between all successive frames of the video. Also, it would have been obvious to one of ordinary skill in the art to have Kim's object region data generation include Katsaggelos' application as a computer readable program code means because dynamic programming improves the use of a prediction method that

uses shape coding of a polygon approximation along with motion modeling to describe object region deformation.

As per dependent claim 23, Kim discloses the vertexes in each of the at least three frames are associated each of the same vertexes in the adjacent frame such that a distance between each of the vertexes in each of the at lest three frames and each of the same vertexes in the adjacent frame is minimum (col. 3, ll. 60-66).

As per dependent claim 24, Kim discloses the associating each of the vertexes with each of the same vertexes comprises estimating vertexes in the adjacent frame based on the trajectories (i.e. determining a predicted vertex) (col. 3, ll. 60-63), and selecting the vertexes in the adjacent frame, that are closest to the estimated vertexes (col. 3, ll. 64-66).

As per dependent claim 25, discloses the associating each of the vertexes with each of vertexes comprises obtaining a characteristic quantity (i.e. distance) of the vertexes of each of the at least three frames (col. 3, ll. 60-67) and associating the vertex in each of the frames and the same vertex in the adjacent frame which have the closest characteristic quantity (col. 4, ll. 10-15).

As per independent claim 26, Kim discloses generating a polygon approximating a contour of the object region in at least three frames, the polygon having vertexes (col. 3,

ll. 23-30); associating each of the vertexes in each of the at least three frames with each of the same vertexes in an adjacent frame (col. 4, ll. 6-15); obtaining trajectories, each of the trajectories linking the same vertexes through the at least three frames (col. 4, ll. 6-15); estimating positions of vertexes of a polygon in a next frame based on trajectories, the next frame following a last frame of the at least three frames for which the trajectories are obtained (col. 5, ll. 46-54); moving the position-estimated vertex in accordance with a contour of the object region in the next frame (col. 3, ll. 44-49); updating the trajectories by associating each of the moved vertexes with trajectories linking the vertexes which are the same as the moved vertexes (col. 5, ll. 35-55); and generating the object region data, the object region data comprising an approximate function data expressing the updated trajectories (col. 5-6, ll. 64-5; col. 6, ll. 48-60).

Kim fails to specifically disclose at least three frames and a computer readable program code means.

Katsaggelos discloses an application for an coding algorithm like object based analysis synthesis coding which uses object shape, texture and motion to describe moving video objects (pp. 1, col. 2, Para 1).

The rationale as applied in the rejection of claim 22 applies herein.

Response to Arguments

4. Applicant's arguments filed 10/18/06 have been fully considered but they are not persuasive.

Applicant argues (pp. 12, Para 3) Kim does not teach obtaining trajectories linking the same vertexes through the frames....

In response, Kim teaches mapping the vertices between predicted vertices and motion compensated vertices (col. 3-4, ll. 60-15). Therefore, Kim teaches associating the vertexes in each of the frames. Additionally, Kim teaches an improved method of processing contour information which is used in MPEG coding of transmitted video image data that is processed on a plane/frame (VOP, video object plane) by plane/frame basis, where the plurality of planes/frames includes at least three (col. 1, ll. 30-60). The processing of video data present in a plurality of planes/frames suggests that Kim teaches processing contour/trajectory information for video data over the plurality of planes/frames, which includes at least three frames.

Kim teaches aligning centers of gravity of two polygons such that the distance between the vertices of the polygons in adjacent frames is a minimum (col. 3-4, ll. 15-35), which results in the linking of associated vertices as Applicant's Specification also indicates (Specification pp. 15-16, ll. 10-10). Therefore, Kim teaches obtaining trajectories linking vertexes through frames. Additionally, Kim teaches an improved method of processing contour information which is used in MPEG coding of transmitted video image data that

is processed on a plane/frame (VOP, video object plane) by plane/frame basis, where the plurality of planes/frames includes at least three (col. 1, ll. 30-60). The processing of video data present in a plurality of planes/frames suggests that Kim teaches processing contour/trajectory information for video data over the plurality of planes/frames, which includes at least three. Lastly, Applicant admits (Response to Arguments pp. 13, Para 1) Kim's disclosed use of GMV, in determining vertex trajectory, shifts all vertices and provides motion compensated vertices, where the motion compensated vertices information represents positions of the vertices. Hence, positions of vertices correspond to coordinates, e.g. X and Y. Thus, Examiner maintains that Kim teaches obtaining trajectories linking the same vertexes through the frames....

Applicant argues (pp. 13, Para 3) Kim does not teach generating the object region data comprising an approximate function data expressing the trajectories.

In response, Kim teaches using a line to approximate the trajectories (col. 5-6, ll. 64-5; col. 6, ll. 48-60), such that a computed difference error between corresponding segments on each of the respective predicted contour and current contour is used to provide a transformed coefficient that is in turn used to reconstruct the contour (Fig. 2 & 3; col. 6, ll. 5-52). Therefore, Kim teaches an approximate function data expressing the trajectories as he teaches generating a coefficient that represents the approximate motion of vertices on a contour, from one contour to the next contour.

Based on the above provided rationale, the claims do not patentably distinguish over the applied prior art.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chante Harrison whose telephone number is 571-272-7659. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on 571-272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Chante Harrison
Examiner
Art Unit 2628

Chante Harrison

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August 10, 2007